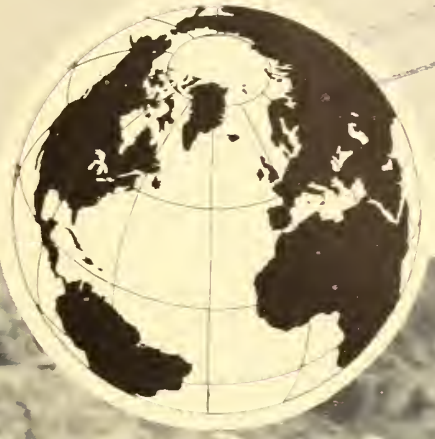
Foreign Agriculture



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FRONT COVER

Early Plant Explorer

Frank N. Meyer, one of the first plant explorers of the Department of Agriculture, was photographed with some of his findings in the mountains near Wu Tai Shan, Shansi, China. February 26, 1908. (Photo courtesy BPISAE.)

BACK COVER

Map Showing World Contributions to The Agriculture of the United States

Each corner of the world has added to the rich diversity of American agriculture. Ship captains, missionaries, consuls, and explorers were numbered among the first agents in the great campaign of plant introduction that has persisted ever since the first settler came carrying his precious packets of seed. As time went on, agricultural societies, government offices, and scientific organizations added their larger-scale efforts to the seeking out of new plants and seeds from all over the globe. And the search still goes on. (Based on information supplied by C. O. Erlanson.)

NEWS NOTES

Mr. Hepler Takes Post in the Philippines

Agricultural extension adviser in the Philippine Islands is the position newly assumed by *John V. Hepler* of the Office of Foreign Agricultural Relations. For 3 years Mr. Hepler has been head of the Extension and Training Division of OFAR's Technical Collaboration Branch. From Kansas county agent to international work in agriculture is Mr. Hepler's record during a 32-year extension career. He has served in County, State, and Federal positions in Kansas, New Mexico, South Dakota, and Washington, D. C. The new assignment comes at the request of the Government of the Philippines, which seeks to better coordinate its agricultural extension services and to analyze the opportunities for using extension methods to help meet its agricultural problems. This is an expansion of the program that the Department of Agriculture has been carrying on in Latin America for the past 10 years.

OFAR Marketing Specialist Studies Caribbean Dairy Markets

George H. Day, Marketing Specialist, OFAR, is making a 2½-month study of dairy markets in Cuba, Dutch West Indies, Venezuela, Colombia, Panama, Costa Rica, and Mexico. These countries are generally deficient in milk. Therefore, the study has two general objectives: (1) Evaluation of long-term marketing prospects for United States dairy products and (2) solution of current marketing problems, which include packaging, shipping, import limitations and requirements, various uses for dairy products, and problems related to the technical aspects of marketing. The United States dairy industry has shown a wide interest in the proposed investigations and gave Mr. Day valuable assistance in preparing for the investigation abroad.

Credit for photographs is given as follows: pp. 51, 52, BPISAE; p. 53, PMA; p. 56, Office of Information; p. 62, Joseph L. Dougherty.

FOREIGN AGRICULTURE ALICE I. FRAY, EDITOR

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The World Is Our Nursery

by LEWIS P. McCANN

Agriculture in the United States began as a blend of the Indian and the European, and over the past 300 years it has been enriched by contributions from the whole world. Every major crop grown in the United States today is an immigrant. Plants that colonists brought from their homelands and those that were gathered by ship captains, missionaries, consuls, and plant explorers have been adapted to our varied climates, conditions, and needs, first by trial and error and later by planned experiment.

This blend of the world's agriculture is a highly successful one. It has given us a $125 billion agricultural industry, made us the best-fed people in the world, and given us the means for repaying, in food and technical assistance, those nations from whom we have borrowed.

Since 1898 when plant introduction was formalized as a distinct unit of the Federal Government 185,000 collections have been received and numbered. Of these, about 80 percent are familiar crops on American farms and many others are still in the testing stage. Outstanding examples of these plant immigrants that we have adopted are soybeans, alfalfa, and lespedeza.

Soybeans came to us from southeastern Asia by way of consuls, missionaries, seedsmen, and plant explorers. Most of the types now grown were brought in 20 years ago by two of the Department of Agriculture's plant explorers. Their 2-year expedition cost American taxpayers $50,000. In return for this investment, the United States has a new industry valued at more than a billion dollars a year. Soybeans alone have already repaid many times the total cost of all our plant introduction work.

Soybeans, grown principally in the Corn Belt, are one of the most versatile products from the American farm. They are used not only as feed and as food, in margarine, shortening, and flour, but also in such products as plastics, soap, paint, and synthetic rubber.

Alfalfa is another famous plant immigrant from Asia that we have come to think of as American.

It came to us in two ways. Easterners going to California by way of the Horn during the gold rush got alfalfa seed in Chile, where it had come from Spain. They found it suited to their new land, and it quickly became a popular forage crop.

At about this time, Wendelin Grimm, a German immigrant, planted in Minnesota alfalfa seed that he had brought from his homeland. This was our first winter-hardy variety.

Half a century later, alfalfa was growing on 12 million acres of farm land, but it was beginning to die out after 2 to 4 years from bacterial wilt. Department plant explorers began to search for resistant strains in areas where alfalfa had been growing for thousands of years—in western China, northern India, northeastern Iran, and Turkistan. They found several with which plant scientists worked for years to develop the well-known Ranger variety that had good forage qualities and was resistant to cold and wilt.

Another expedition in the mid-1930's brought home a new kind of alfalfa from northern Turkey—a single plant that spreads over an area of several square feet of soil by sending up shoots from underground rhizomes. This new alfalfa promises to be highly important as a pasture mixture and hay.

Dr. McCann is Regional Coordinator, U. S. Plant Introduction Garden, Glenn Dale, Md.

The Meyer medal for outstanding plant introduction depicts history's first known search for new plants—Queen Hatshepsut's expedition to the Land of Punt.

1898: First introduction of the soybean was made by Department of Agriculture plant explorers who found it an established crop in China.

To farmers of the southern Mississippi Valley, the lespedezas are the most important of the plant introductions. The two annuals, common lespedeza and Korean, excellent soil-improving cover crops, have revolutionized agriculture over 20 million acres of that area. Korean lespedeza, for example, was bringing an annual income of $120 million to southern Mississippi Valley farmers 30 years after its introduction.

Nobody knows how common lespedeza came here from Asia, but it was growing in the fields and along the roads of Georgia a hundred years ago and is now found as far west as Missouri.

Korean lespedeza was introduced by plant explorers, first as a half-ounce package of seed from Korea. Its adaptability and hardiness soon made it popular and extended the use of lespedeza as far north as the Great Lakes. We now have about 40 million acres of this species in cultivated and pasture lands.

Not all of our plants emigrated from Asia, of course. Ladino clover came from Italy, and strawberry clover from France. The Washington navel orange was introduced from Brazil, and ancestries of most of the new crown rust-resistant oat varieties can be traced to Department introductions from South America and Australia.

Early Random Introductions

The first introductions came from Europe with colonists who settled in this country more than 300 years ago.

They planted crops that they needed for food and feed in natural clearings and on land that they cleared.

Their principal crop was Indian corn, but grain that they had brought from home was also planted—wheat, rye, barley, oats, buckwheat. They had little livestock, but all that they had except turkeys came from Europe.

From the Indians these early colonists borrowed not only maize but also sweetpotatoes, tomatoes, pumpkins, gourds, squashes, watermelons, beans, peas, grapes, berries, pecans, black walnuts, peanuts, maple sugar, tobacco, and cotton.

The first evidence of a change in the character of agriculture came about the time that the Dutch colony of New Amsterdam became the English colony of New York in 1674. Farmers began to specialize in certain crops and buy those that they did not raise. Wheat became a staple crop with rye and barley secondary in importance. Indian maize, for the hogs and horses and somewhat for meal, was raised after the fashion of the Indians. Though their crops had more variety, in culture, harvesting, and threshing, the colonists were not much advanced beyond Biblical times.

Throughout the eighteenth century, little or no attention was paid to farm animals or to their feed or forage. The animals foraged and browsed for themselves through the scattered clearings and almost continuous forests. The lack of grass was perhaps the greatest handicap of the early American farm, and this led to the importation of timothy, bluegrass, and clover.

Colonists also brought fruit with them and found new kinds here. As trees matured from seeds brought and planted by immigrants, fruits of European origin such as apples, pears, peaches, and cherries were found in the dooryards of most of the early American homes. The native fruits—blueberries, huckleberries, cranberries, grapes, strawberries, raspberries, blackberries, and dewberries—were left undomesticated and collected from the wild. Indeed, most of these fruits are still collected from the wild, but selections have been

1949: In half a century, soybeans have become a billion-dollar industry in the United States.

made and plant breeders have produced many superior varieties from the wild fruits that are now commercially available.

Not until just before the Revolutionary War was any thought given to the possibility of replacing seedling fruit trees with improved budded varieties. One of the first commercial nurseries to be established in the colonies was the Linnaean Botanic Garden founded by William Prince. In 1771, Prince advertised a number of budded materials for sale, listing 24 apples, 9 apricots, 18 cherries, 12 nectarines, 29 peaches, 42 pears, and 33 plums. Only 3 apples of the group were originated in America; the remaining fruits were from Europe.

The white potato, now regarded as our most important vegetable, came from South America. Although early Americans grew it for home use, it was not considered a salable crop until after 1800. Beans were grown in home gardens but were not sold commercially. Most vegetables were grown for immediate home consumption. The perishable nature of the vegetables and the lack of transportation, handling, and marketing facilities did not encourage production for sale.

Ornamental plants were not congenial to pioneer life. There was little time to devote to the aesthetic after the work in the fields, forests, and kitchen was done at the end of the 6-day workweek. Sundays were actually consecrated as days of rest. As some individuals accumulated capital goods that permitted some leisure, flower gardens began to appear. Hollyhocks, pansies, tulips, pinks, marigolds, daffodils, and sunflowers were found around the homes, and seeds could be obtained from stores and by exchange.

Organized Introductions

After the Revolution when social and business life changed from itinerant and nomadic pioneering to settled community life, farming as a business enterprise began. Gentlemen farmers such as Washington and Jefferson were instrumental in spreading interest in variety trials of all crop plants. Soon many individuals began to recognize the importance of agricultural improvement. Especially emphasized was the introduction of certain kinds of plants and seeds from Europe.

As early as 1792 the Transactions of the Society for the Promotion of Agriculture, Arts, and Manufactures for the State of New York show that recommendations were made to the New York Chamber of Commerce that ship captains sailing from the port of New York be requested to "Procure a small quantity, not exceeding one quart, of those kind of grain which make the principal food of the inhabitants, and this even though it should be wheat, barley, rye, oats, or maize; for though these grains are common in this country, yet there are varieties which may be extremely important, as was instanced in the accidental introduction of the white-bearded wheat, which was found to resist the insect when every other species was destroyed by it." The request reads further to include "pulse and legumens . . . seeds of the species of grasses . . . cattle used for food or draft . . . breed of sheep . . . and land or water fowl."

Governmental participation in plant introduction was slow. Agriculture in general was regarded as an individual problem. As the number of farms grew and as the demand for more and better agricultural produce increased so did the recognition of public officials in the importance of plant introduction.

In 1827 President John Quincy Adams directed all United States consuls to forward to Washington rare plants and seeds for distribution. Twelve years later in 1839 Congress passed its first appropriation for agriculture. The sum of $1,000 was allocated to the Patent Office to be used for collecting and distributing seeds as well as for statistical and other investigation. From this humble beginning the affairs and problems of agriculture increased until 1862 when the Department of Agriculture was organized as a separate branch. The demand and interest in plant introduction continued to increase until 1898 when the Department of Agriculture created a separate unit known as the Office of Foreign Seed and Plant Introduction. This Office has been maintained throughout the years with some changes in name and administrative jurisdiction but with little change in scope and procedure.

The office now known as the Division of Plant Exploration and Introduction is administered through the Bureau of Plant Industry, Soils, and Agricultural Engineering. Though the Department of Agriculture has outgrown its first appropriation in terms of money and purpose, the need that brought about the first appropriation has not lessened nor has plant introduction been curtailed. Rather, the work has been intensified just as our agriculture has become intensified.

Agricultural development during the twentieth century of intensive and extensive crop production has introduced new problems and needs for new plants. Not only do we need new plants but we also need new genetic characters to be found in the wild ancestors of our cultivated plants in order to combat disease, in-

sect, and environmental problems. Plant exploration has become a diversified yet specialized business to service the demands of the research men in plant pathology, breeding, physiology, agronomy, horticulture, and other fields of pure and applied botanical sciences. Recent research in the hormone field and antibiotics has indicated that the plant world is practically untouched from the standpoint of extracting phytochemicals for the treatment of human diseases and for general use as antibiotics.

Preserving Agricultural Assets

The present plant introduction and testing program offers the States and the various plant agencies of the Federal Government an opportunity to coordinate the introduction and evaluation of new material on a much broader and more thorough basis than has been possible before.

In addition to the testing and evaluating, we are not overlooking the necessity of preserving valuable germ plasm existing in our common cultivated and wild plant materials. Seed storage facilities are now under construction, which will provide fireproof and rodent-proof rooms in which temperature and relative humidity controls will provide conditions that will extend the viability in storage of newly introduced, unevaluated materials as well as serve as a germ-plasm bank for our more important genetic lines of superior crop plants.

Plant introduction was recently given stimulus by the Research and Marketing Act of 1946, which embodied the following excerpt:

> . . . to encourage the discovery, introduction, and breeding of new and useful agricultural crops, plants, and animals, both foreign and native, particularly for those crops and plants which may be adapted to utilization in chemical and manufacturing industries.

Funds were made available to the Division of Plant Exploration and Introduction during the fiscal year 1948 to establish a national cooperative project for introducing, testing, evaluating, and preserving new plant materials.

Since the beginning of this project, five different foreign expeditions have been in the field collecting plant materials in Argentina, Brazil, Guatemala, India, Mexico, Turkey, and Uruguay. Plant accessions from these expeditions number well over 12,000. About 2,000 are being tested in various cooperating experiment stations throughout the Northeast and North Central regions and a large backlog awaits space and facilities in the West and in the South. It is much too early to list any specific finds from the expeditions.

The introduction of plants for industrial uses involves not only the usual horticultural and agronomic tests but also the added problems peculiar to making produce into a product. Many questions arise. For example, are the costs of production prohibitive? Many crops can be grown successfully in the United States from the agricultural point of view. Pyrethrum can be produced successfully in Pennsylvania, but costs of land, labor, and processing are too high to compete with the lower costs in Japan or Kenya Colony in Africa. Certain fiber crops can be grown within the continental United States, but hand labor for decorticating runs the costs beyond those of Pakistan and India. Plant breeding and new types of machinery might serve to lower costs to a competitive level or war might make production costs insignificant, but under normal conditions we cannot afford to grow pyrethrum flowers for insecticidal use or fiber plants for our bagging, binder twine, carpeting, and cordage.

Over a period of about 300 years, our agriculture has expanded to a point hardly envisioned by even the most forward looking of our founding fathers.

There is reason to believe, however, that our present methods of production and the quality and quantity of our food and agriculture will be changed as the world continues to be a smaller place in terms of transportation and political access. Ravages of disease, insects, and climate are always working against us. We must continue to look for new germ plasm that will give plants resistance to new diseases and insects. We are a quality-conscious nation—and we must continue to look for those quality factors that meet the increasingly high standard of our consumers.

Plastics made from fish waste are now for sale in Norway. Some of the finished products are transparent; others vary from light pastel tints to black. The articles are fireproof and the material is said not to split when worked.

In manufacturing the plastic powder from which such articles are made, nearly all of the fish that remains after the fillets are cut off is used—about 40 percent. The product is a protein thermosetting plastic.

The manufacturing firm began turning out the plastic powder about a year ago. Present production is about 10,000 pounds a day.

USDA Mission to the Eastern Hemisphere

Three technical experts of the United States Department of Agriculture began a round-the-world trip a month ago that will take them into 12 Eastern Hemisphere countries which seek cooperation of the United States in programs of agricultural improvement.

The three agricultural men are Dr. Albert H. Moseman, Agricultural Research Administration; Paul V. Kepner, Extension Service; and Dr. Ross E. Moore, Office of Foreign Agricultural Relations.

Countries to be visited during the 80-day trip include Egypt, Syria, Lebanon, Iraq, Iran, India, Pakistan, Afghanistan, Ceylon, Burma, Thailand, and the Philippine Islands.

In discussing proposed projects with host governments, Dr. Moseman will represent the Department's research resources. Mr. Kepner will represent the Department's experience in helping put agricultural science to work on United States farms. Dr. Moore will represent the Department's decade of experience in helping develop agricultural resources of other countries, largely those of Latin America.

The members of the mission will assist American embassies in negotiating written agreements under Public Law 402, a program of international technical cooperation. The work now being done under this law is similar to that envisioned on a larger scale by the proposed Point IV Program.

Specific projects will be discussed, many of them designed to increase food production.

In carrying out programs of technical cooperation in agriculture in the Eastern Hemisphere, the cooperating countries will have available the experience gained by the Department since 1939 in administering joint agricultural programs with 15 governments of the American Republics. In such programs the United States supplies technical assistance and some specialized equipment, and cooperating governments supply physical facilities, counterpart technicians, laborers, and day-to-day costs of carrying out the joint projects. There is concrete evidence that such programs are benefiting the agriculture of participating countries and the economy of the United States.

Members of the mission show Secretary of Agriculture Charles F. Brannan their air route to 12 Eastern Hemisphere countries. Left to right, Dr. Moseman, Mr. Kepner, Secretary Brannan, and Dr. Moore.

Tobacco in Western Europe

by CLARENCE E. PIKE

Western Europe is the most important tobacco-importing area in the world, normally taking more than 60 percent of all leaf tobacco entering world trade.[1] This outlet is of particular importance to United States tobacco producers and exporters because in most years more than 70 percent of all United States exports of unmanufactured tobacco has gone to Western Europe.

At the present time the pattern of trade that will develop when economic conditions in Western Europe become more stabilized is somewhat uncertain. As a result of shortages in dollar exchange and governmental policies giving preference to leaf from their colonies and other soft-currency areas, Western European countries are now purchasing as much tobacco as possible in Southern Rhodesia and other nondollar surplus-producing countries, which grow types that can be used as substitutes for United States leaf. Tobacco production in these countries, which include Indonesia where the output of leaf was greatly reduced during the war, is now expanding rapidly.

United States tobacco growers and exporters are concerned about this trend and fear that they may lose a share of the Western European market. Oriental-tobacco growers, on the other hand, fear that the trend in consumer preference to United States type blended cigarettes and away from straight oriental cigarettes, coupled with the financing of United States leaf exports to Western Europe by the Economic Cooperation Administration and other grant funds, may be detrimental to their interests.

Although the market situation for leaf tobacco in Western Europe is admittedly uncertain, its historical and immediate postwar development gives some indication of the future pattern of trade.

Historical Background

Europeans first saw tobacco in 1492 when Christopher Columbus and his crew observed the Indians of the West Indies using it. When Columbus returned to Europe, tobacco was one of the New World products that he took with him.

For more than a century after tobacco was introduced in Europe, Spain dominated the trade, and practically all tobacco on European markets came from the Spanish-American Colonies. By the middle of the seventeenth century the plant was being cultivated in many parts of the world, and Spain gradually lost its position. Tobacco production was begun in the British Colony of Virginia in 1612 and increased rapidly there and in the adjoining colonies of North

Picking tobacco in Italy, the principal tobacco-producing country of Western Europe.

[1] For this article the following Western European countries are included: Austria, Belgium, Denmark, France, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and Western Germany. Adjustments have been made to place all data on the basis of present boundaries.

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Carolina and Maryland. Tobacco from what is now the United States soon gained a dominant position on the Western European market—a position that it has held to the present time.

For many years after its introduction tobacco was used in Europe principally for medicinal purposes, and marvelous healing powers were often ascribed to the weed. It was recommended for such diverse ailments as toothache, falling fingernails, worms, halitosis, and even such fatal diseases as lockjaw and cancer. But, while its virtues as a medicine were being propagated, adventurers were coming back from the Western World smoking pipes and cigars solely for enjoyment. They introduced this use for tobacco in the port cities and along the trade routes of Europe and from these it was disseminated by the end of the sixteenth century throughout the Old World.

After its early unfounded popularity as a medicine, many attempts were made to stamp out the use of tobacco in Europe. Almost as many human ailments were attributed to the use of tobacco as its early proponents had claimed cures. A number of royal and ecclesiastical edicts were issued prohibiting its use. Some of these even specified the death penalty for violators. All measures proved ineffective, however, and were gradually repealed or their enforcement ignored.

Revenue from Tobacco

Soon after its introduction, Western European governments discovered the revenue-earning value of tobacco and were quick to develop methods of collecting income from it. The methods most commonly used have been (1) import duties, (2) state monopolies, and (3) excise taxes. In the past, as at present, the major part of the price that Western European consumers pay for tobacco products reverts to the national treasuries.

Import duties were among the earliest methods used for collecting revenue from tobacco, and the duties were often accompanied by laws forbidding the domestic production of leaf. The United Kingdom has always depended almost entirely on its import duty for collecting revenue from tobacco. That country, which is the world's leading importer of leaf, has an exceedingly high import duty, amounting at present to £2 18s. 2d. ($8.14) per pound on non-Empire unstemmed leaf containing 10 percent or more moisture.

State monopolies have been in existence since the middle of the seventeenth century. The monopoly in France has a long continuous history and still controls every phase of the tobacco industry in that country. In addition to France, monopolies are now operated

Removing the cover from a hogshead of United States flue-cured tobacco, Royal Victoria Docks, England.

in Austria, Italy, Portugal, Spain, and Sweden. Where monopolies exist complete control over the production, manufacture, and trade in leaf tobacco and tobacco products is maintained, and the profits of the monopolies revert to the national treasuries. Normally, products are priced at a level that will result in a volume of sales that will bring in the largest possible revenue.

Except in the United Kingdom and the monopoly countries, excise taxes are generally the most important method of collecting revenue from tobacco, but import duties are also important in some of these other countries. Excise taxes are usually collected by the sale of stamps, which are required to be affixed to every package of any tobacco product offered for sale.

Production and Trade

Before the middle of the sixteenth century, Western Europe depended on imports for all its tobacco. Since then some has been produced domestically. The first record of tobacco being grown in Europe was in France in 1556 from seed brought from Brazil. For a century or more after this experimental planting, cultivation was restricted primarily to small garden plots. By 1800, however, tobacco was being grown on a limited commercial scale principally in Germany, France, Belgium, Italy, and the Netherlands.

During the nineteenth century, tobacco consumption and trade increased rapidly. The countries of Western Europe followed a policy of relatively free trade and found it to their advantage to depend on imports to supply most of their tobacco requirements. As a result, little effort was made to increase materially the domestic production of leaf. The United States was the principal source of supply, but large quantities were also imported from Indonesia, the Philippines, Latin America, and elsewhere.

By the beginning of the twentieth century, Western Europe was using large quantities of tobacco. Just before World War I, in the years 1909–13, for example, these countries imported and produced a total of about 600 million pounds (dry weight basis) a year.

Most of this tobacco was imported; only 13 percent was produced domestically. France was the leading tobacco-growing country, followed by the area now in Western Germany, Italy, Belgium, Sweden, and Switzerland. The United States continued to be the most important source of leaf, supplying an annual average of approximately 42 percent of all leaf consumed. Latin America supplied about 7 percent and Turkey, Greece, and Bulgaria, the principal oriental-type tobacco-producing countries, only 4 percent. Most of the rest came from Indonesia, certain Eastern European countries, the Philippines, India, and Algeria.

During this period, pipe mixtures and cigars made up the bulk of tobacco products consumed. Chewing tobacco and snuff were also popular in certain countries, but cigarette use was not general. Cigar and other dark types of leaf made up an estimated 80 percent of all tobacco consumed. Flue-cured and light air-cured types, exclusive of oriental leaf, made up approximately 15 percent. Oriental-type leaf represented less than 5 percent of the total.

After World War I, a number of changes occurred in the market for tobacco in Western Europe. High tariffs, preferential duty rates, bilateral trading, and many other governmental restrictions and regulations were imposed on the tobacco trade in a number of countries. The cigarette became increasingly popular. The use of pipe tobacco and cigars declined somewhat, and chewing tobacco and snuff dropped sharply. There was also a change toward the use of lighter, milder types of tobacco. By the period 1935–39, it is estimated that flue-cured and light air-cured leaf, other than oriental, represented 35 percent of total consumption, oriental types 10 percent, and cigar and other dark types 55 percent.

By this time the quantity of leaf supplies imported and produced in Western Europe had climbed to an estimated 910 million pounds annually. Nationalistic, self-sufficient policies adopted by a number of countries after World War I resulted in a steady increase in domestic production of leaf, which during the 1935–39 period made up an average of approximately 17 percent of the total supply. Italy had become the leading tobacco-growing country, followed by France, Western Germany, Spain, Belgium, Switzerland, and Sweden. The United States remained the most important source of leaf, supplying an average of about 34 percent of the total supply of leaf made available annually. Turkey, Greece, and Bulgaria supplied only 10 percent and Latin America about 7 percent. Other countries, again principally Indonesia, supplied 32 percent.

TABLE 1.—*Estimated quantity of tobacco produced and imported by Western Europe, by sources, averages 1909–13 and 1935–39, annual 1946 1947, and 1948* [1]

Year	Domestic production		Imports								Total	
			United States		Latin America		Turkey, Greece, and Bulgaria		Other countries			
	Million pounds	*Percent*	*Million pounds*	*Percent*	*Million pounds*	*Percent*	*Million pounds*	*Percent*	*Million pounds*	*Percent*	*Million pounds*	*Percent*
1909–13	75	13	250	42	44	7	26	4	205	34	600	100
1935–39	150	17	305	34	68	7	95	10	292	32	910	100
1946	225	24	485	52	100	11	16	2	99	11	925	100
1947	280	29	380	40	130	14	30	3	130	14	950	100
1948	260	32	300	37	65	8	50	6	135	17	810	100

[1] The following Western European countries are included: Austria, Belgium, Denmark, France, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and Western Germany. Adjustments have been made to place all data on the basis of present boundaries.

At the end of World War II the tobacco stocks of most Western European countries were largely depleted because they could not maintain imports during the war. Domestic production had also declined as a result of the disruption of the economies of the warring powers. Immediately after the cessation of hostilities, domestic production increased, and the countries began importing large quantities of leaf in an effort to rebuild stocks and to increase the quantity of tobacco products available to consumers.

There was also an accelerated trend toward lighter, milder tobaccos, which had been under way since World War I. The demand for cigarettes made large gains at the expense of all other tobacco products. Smoking tobacco and cigars, however, showed a less drastic decline than did chewing tobacco and snuff. The demand for United States type blended cigarettes, which had shown substantial gains prior to the war in several of the countries, became extremely popular throughout all of Western Europe except in the United Kingdom and Ireland. Much of this gain in popularity was generally attributed to the wide dissemination given United States products by our military personnel serving in Europe during and after the war. There was a sharp decline in demand for cigarettes made entirely from oriental-type tobacco, which, prior to the war, had been the most popular type of cigarette in some of the continental countries.

Domestic production reached an all-time high in 1947. Imports of leaf from the United States in response to demand for lighter-type products including blended cigarettes rose to 52 percent of all leaf made available (domestic and foreign) during 1946 but dropped to 40 percent in 1947. Oriental-type leaf from Turkey, Greece, and Bulgaria made up less than 2 percent of the total supply in 1946 but increased to more than 3 percent in 1947. Latin American leaf represented 11 percent of the total in 1946 and 14 percent in 1947.

By the latter part of 1947 the countries of Western Europe, with the exception of Austria and Western Germany, had gone a long way toward rebuilding their leaf stocks. At this time, also, the availability in Western Europe of dollar exchange for the purchase of Western Hemisphere tobacco became limited. Numerous import controls and other governmental restrictions were imposed in an effort to expand trade with soft-currency areas. As a result, importations from the United States and Latin America have been restricted and efforts intensified to obtain maximum quantities of leaf from soft-currency areas. The desired quantities and qualities of leaf were unavailable in these areas, however, and total imports declined. On the other hand, consumption was generally maintained by reducing stocks, particularly stocks of United States leaf.

In 1948 imports from the United States further declined, representing 37 percent of all leaf made available (domestic and foreign). Trade with Latin America was even more adversely affected, but imports from oriental-type tobacco-growing countries continued to increase, supplies from that area amounting to more than 6 percent of the total, and the surplus-tobacco-producing countries of Africa began to be more important as suppliers. Domestic production remained high.

Outlook

Several factors indicate that there may be little or no permanent loss in the Western European market for either United States or oriental tobacco.

Since tobacco is a major source of revenue in all Western European countries, it is to the interest of these governments, therefore, to make tobacco products available to consumers at a level that will produce maximum revenue.

Domestic production of leaf, which is significant in only five Western European countries, is currently well above prewar. The increase has been accomplished at high costs, however, and, although production is likely to remain above prewar, some reduction in total output may occur as soon as exchange conditions improve and increased imports are possible.

Efforts to curtail tobacco consumption have not been too effective, and declines from prewar levels have occurred only where drastic measures have been used. In all countries where taxes on tobacco products have been maintained at reasonable levels, and leaf made available to manufacturers has not been rigidly restricted, consumption is above prewar.

Imports from southern Africa may remain high and, as production in Indonesia increases, imports from that area may approach the prewar volume. If the expected over-all increase in consumption occurs, however, Western European countries will still need to import as much tobacco from the United States and the oriental-type tobacco-producing countries as in the prewar (1935–39) period.

As a result of the shift in consumer preference in a number of countries to United States type blended cigarettes, straight oriental cigarettes represent a smaller percentage of the total cigarette trade than in prewar days. This has resulted in an increased de-

mand in those countries for United States flue-cured and light air-cured tobaccos. Although oriental-to-bacco-growing countries fear that this shift has been detrimental to the market for their leaf, the universal increase in cigarette consumption and the decline in demand for other tobacco products have increased the market for light cigarette tobaccos, which include oriental leaf. This trend, however, has been detrimental to the market for cigar and other dark tobaccos, including United States fire-cured and dark air-cured types. In the United Kingdom, where cigarettes account for about 90 percent of total tobacco consumption, a minimum of 5 percent oriental leaf is now being used in all cigarettes manufactured for home consumption. Prior to the war, cigarettes consumed in that country were made almost exclusively of flue-cured leaf. Larger than prewar quantities of oriental leaf are also now being used in France and a number of other countries.

Until Western Europe's foreign-exchange difficulties have improved, the availability of exchange will be one of the most important factors bearing on the volume and source of leaf imports and the policies of its governments toward domestic production. As the exchange and trade situation improves, however, leaf prices and consumer preference are expected to become increasingly important in determining the types and sources of leaf used. Therefore, in their effort to retain their historically important position in the Western European market, United States tobacco growers will need to continue their efforts to improve quality and to keep prices attractive.

African Drought*

by DON LOOPER

Drought covered most of Africa last year affecting crop production in many of the continent's nondesert areas and leaving food supplies short in some sections. Generally, food supplies were adequate, but old-timers in South Africa and in the Zambezi Valley of Northern Rhodesia said drought there was the worst in 100 years.

A large area in the heart of the Union of South Africa suffered severe drought, and agricultural leaders warned that drought and overstocking would result in serious soil erosion. Dry areas were spread throughout most of the continent with these areas all suffering drought at some time during the year: the Anglo-Egyptian Sudan, British West Africa, French East Africa, French Equatorial Africa, French West Africa, Northern Rhodesia, and Southern Rhodesia.

The drought was spotty, however, and cocoa and coffee plantations in the West Coast regions of Angola, Nigeria, and the Gold Coast got too much rain. Notable exceptions to the African drought picture were Mozambique, which had good rains and crops in 1949, and South West Africa, a semidesert region, which has had its best agricultural season since 1934. The Mediterranean countries of North Africa also escaped serious drought.

Food shortages are reported in Northern and Southern Rhodesia and Nyasaland, and famine exists in parts of Tanganyika in British East Africa. The food positions of most other areas are normal or nearly so despite dry weather. South Africa's all-important corn crop was short because of drought, but large carry-over stocks filled the breach in that country's food supply for the 1949–50 consumption year. Water supplies are seriously short at a number of smaller cities and towns on the southern coast.

Greatest human suffering seems likely in the British

*This article is based on Foreign Service reports.

mandate of Tanganyika, which in some areas produced only one-fourth to one-third of normal crops. Every Province's food shortage has been alleviated to some degree by purchases from Kenya's surplus pool of corn and wheat. United States consular representatives reported in December that the Eastern Province would face famine conditions lasting until July if the seasonal short rains were further delayed. Scanty rains in the western areas were delaying general cultivation and necessarily prolonging famine relief.

The neighboring colony of Kenya harvested a bumper wheat crop in 1949, making possible a large surplus to be taken over by the East Africa Cereals Pool as an emergency stock against general food demands.

It was in Kenya that crops were trampled by some 5,000 thirsty elephants, which had begun their annual trek from the bush areas to the coast hinterland earlier than usual because of drought. Government officials turned them back.

Drought cut agricultural production in the Rhodesias and Nyasaland and food shortages are aggravated by rapidly increasing population and large expansion in tobacco production at the expense of food crops. Supplies of corn, meat, and dairy products are particularly short.

An area of 100,000 square miles in the Union of South Africa has endured severe drought, and reports differ regarding the amount of suffering among natives in the interior. Corn production in the Union was somewhat short, but stocks from the 1948–49 crop maintained near normal supplies. Prospects for the 1949–50 crop appear favorable due to well distributed and sufficient rainfall in the past few weeks.

Wheat production also was down, but livestock farming suffered most. Thousands of cattle died for lack of pasture, and others were slaughtered because of poor feed supplies. Others died as the result of eating poisonous plants, which normally they would not touch. Thousands were shipped north by rail to pasture areas in the Transvaal, and hay was shipped from that Province to the drought area. Two large irrigation dams in the eastern Cape Province were dry.

The sheep industry has not suffered as much, and most European farmers were able to feed their sheep even in drought-stricken areas where it was impossible to pasture cattle. Even so, there were many losses of sheep and goats.

The drought has been felt severely at a number of smaller inland cities such as Queenstown and King William's Town, but water shortage became critical in the seaport town of East London, forcing strict water rationing on that sixth largest city of the Union. East London hopes that the new Laing Dam being constructed on the Buffalo River at Fort Murray will overcome water-shortage problems in the future. The dam, still virtually dry, probably will be finished late in 1950. Another dam is being built across the Buffalo River at Rookrantz and the Maden Dam already is in service at King William's Town.

As serious as the immediate drought situation has been, certain forward-looking observers in South Africa see deserts on the march and fear the future even more. They are afraid southern Africa—a great agricultural region—is turning to desert under a double assault by the frugality of Nature's rainmakers and mankind's overstocking and plowing of grasslands.

Periodic droughts have occurred in the past decade. At the same time much of the pasture land has been planted to peanuts and grain and the rest is being overgrazed. As a result, the soil has little protection from wind, and much of South Africa's productive farm land is literally blowing away. The area has

In British African areas, reduced food output has resulted not only from the drought but also from the shift from food crops to tobacco.

had dust storms for a number of years, but the 1949 storms were the worst in history.

Dr. J. C. Ross, director of the Division of Soil Conservation and Extension, says that if wind erosion is not checked, the area will be completely useless in a few years. Checking erosion will be difficult because (1) it is not easy to establish grass in a low-rainfall area and during extended periods of drought and (2) much more research must go into the development of grasses adapted to the area.

The Government could declare the more critical sections of the country as Soil Conservation Areas, implying complete Governmental control. Officials are reluctant to do this, however, because farm families might have to be moved and because of a shortage of soils technicians.

Overstocking in South Africa is particularly bad in the native areas, where cattle are the measure of a man's wealth and importance. A contributing factor is the system of "lobola," in which a bridegroom receives cattle as a dowry. Native cattle are not slaughtered.

The 1949 drought found Africa in the midst of several significant production trends initiated under various Government development programs. Dry weather may have affected the future of some of these programs, particularly the widely publicized Groundnut Scheme in British East Africa.

Britain, like other European colonizers, has tried since the war to increase vegetable oil and oilseed production in its African areas. One of the most noteworthy postwar agricultural developments in the Union of South Africa has been increased production of vegetable oilseeds and oils. The Union, formerly an importer, now is seeking markets for a surplus, although costs are high and exports would have to be subsidized.

British East Africa—including Kenya, Tanganyika, and Uganda—also has attempted to increase production of oil-bearing seeds, particularly peanuts, flaxseed, and sunflower seed. Increasing population, however, is expected to absorb a large share of expanded production, and any potentially large-scale export of oilseeds would seem to depend upon the success of the British Groundnut Scheme launched in 1947.

This plan, which originally called for more than 3 million acres of peanuts in the three countries, has so far been launched only in Tanganyika. It has been a highly controversial subject in the British press and in Parliament, and drought which seriously damaged the Tanganyika crop in 1949 has added fuel to the controversy.

Besides the project in East Africa, the British have surveyed the prospects of developing a mechanized oil-seed-production scheme in British West Africa. A study mission recommended the cultivation of 2,750,000 acres, which would produce an anticipated 225,000 tons of shelled peanuts per year when fully developed.

Peanuts are French West Africa's principal wealth, and the French Government has launched a scheme for producing peanuts by mechanized methods. The plan includes two projects—at Casamance and Kaffrine. Production in 1949 seems to have been normal.

Belgium is attempting to increase the output of vegetable oils in the Congo by expanding production of palm oil and palm kernels on oil palm plantations. Crop progress was about normal in 1949 with production south of the Equator perhaps somewhat below average because of an abnormally long dry season in 1948. As a result of drought, the Upper Congo River became unnavigable and transport to the eastern part of the colony was difficult.

Congo producers plan to raise their coffee output 50 percent by 1952. The area planted in young trees, not yet producing, has doubled in the past 2 years.

Another significant trend in Africa is a sharp increase in the production of United States type flue-cured tobacco. Drought reduced the 1949–50 crops somewhat in the Rhodesias and Nyasaland but had no effect on plans of producers to accomplish a further large expansion in the next 5 years.

Africa's flue-cured tobacco growing countries—the Rhodesias, the Union of South Africa, Nyasaland, Tanganyika, Kenya, Uganda, and Mozambique—have about trebled their production since prewar. The British Government is encouraging increased production of flue-cured tobacco in British African areas because of the dollar-exchange shortage and the Government's policy of fostering increased trade within the Empire.

All-out production of tobacco in the Rhodesias and Nyasaland is an important factor in the food position of those countries this year. That trend plus growing population and drought-parched crops added up to food shortages this year and indicate future difficulties in narrowing the gap between production and consumption.

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Small-Farm Rubber Production in Latin America*

Cooperative development of natural rubber in the Western Hemisphere reveals a potential long-term cash crop for small farmers.

By R. D. RANDS and WILLIAM MACKINNON

During the past decade, cooperative efforts between neighboring nations has strengthened the footings of the Western Hemisphere's natural rubber industry. Successful methods have been found for growing rubbertrees that are both high in yield and resistant to such enemies as South American leaf blight. As the cooperative work progressed, it became apparent early that natural rubber production offers excellent possibilities as a new cash crop for many small farmers of Latin American countries.

Today there are some 30,000 acres of demonstration rubber plantings, including many family-type farms, in 12 Latin American countries. Most of the larger countries, determined to be self-sufficient in rubber, either have begun or are considering programs to encourage small-farm plantings. Because of the unpredictability of rubber economics of the future, a go-slow policy appears advisable in expanding the acreage of natural rubber in the smaller countries that use little rubber and that are dependent on exporting at world rubber prices. Nevertheless, the advantage to small farmers of having an additional cash crop, where markets warrant, is obvious.

The small-farm plantings now existing were made possible by the cooperative program that has been going on since 1941 between the United States Department of Agriculture and the Governments of Brazil, Colombia, Costa Rica, the Dominican Republic, Ecuador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, and Peru. The scene of most field experiments with rubber, these plantings have become indispensable centers for the research phases of the program.

According to experience in the Far East, the small farm or individual family type of rubber planting is the most economical kind of rubber production. It certainly is best suited to both the temperament and the skills of the people of Latin America. Because rubber plantings take a few years before they begin yielding a cash income, however, government programs to

*Adapted from a paper presented at a meeting of the Latin American Agricultural Extension Workers at Turrialba, Costa Rica.

Tapping a rubbertree.

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Small-farm rubber planting with coffee and plantains interspersed. Under this three-crop plan, plantains are being grown for food and the coffee and rubber are cash crops.

encourage their establishment usually are necessary.

In 1946, Dr. M. F. Barrus, former Extension Director of the Puerto Rico Agricultural Experiment Station, made a study of the problems in Central America, especially in Costa Rica. He found that: "In general, small farmers have no interest in planting rubber on their own initiative because of the lack of knowledge of the plant, lack of money, lack of time, and the uncertainty of a profitable market." Since rubber is not a food, there is also the absence of that appeal.

This attitude is understandable, especially if we recall how long it was after successful plantations had been established in the Far East before native growers of that area began planting the crop. Therefore, stimulation, financial help, and continued guidance during the first 5 years of the planting are absolutely necessary.[1] This is also the conclusion of Latin American Government officials and representatives of the United States Department of Agriculture in the various countries. Not until a few pioneer small-farm plantings in each district are actually producing rubber, which finds a ready market and is sold at a profit, can we expect an industry of this type to develop and expand under its own initiative.

Since rubber as a small-farm enterprise should not exceed 4 hectares (10 acres) per farm, it constitutes only a side line and a source of accessory cash income for the average small-farm operator. Therefore, it is suitable for inclusion in colonization projects such as are being undertaken, for example, in Brazil, Peru, and Colombia. It is equally suitable for introduction into existing communities of small growers when an added cash crop is needed. Examples of the latter type are found in Mexico and Guatemala. Success with rubber plantings of both types usually varies with the effectiveness of the general extension program. It is absolutely necessary that one particular extension agent in each district be specially trained in the methods of handling rubber and that, if possible, each cooperating farmer be visited monthly during the first few years of the planting. Since subsistence and other annual crops are usually grown between the rows of rubber during the first 2 years, this intercropping requires special attention for optimum results from both components.

Another practical small-farm type of development follows a community pattern whereby at least 20 hectares (about 50 acres) of rubber distributed among neighboring farms can be tapped and the latex handled in a central processing factory. This acreage yields the minimum amount of latex necessary for turning out a high quality product. Still more economical would be five 20-hectare units, all within easy reach

[1] Cooperating governments, companies, and individual growers have been spending collectively nearly $2 million annually on their rubber projects.

Five-year-old rubbertrees in a Central American plantation. Most of the trees are ready for tapping.

of a central factory site. Capital costs for a single-unit community factory will approximate $1,000, and those for individual farmers for such tapping equipment as knives, latex cups, holders, spouts, and kerosene cans will total about $50 each.

Estimates of total costs for producing rubber naturally vary for each country and even within districts of the same country depending on the prevailing wage rate in case the individual grower is not doing the work himself. The above and the following estimates are based on local experience and conservative calculations.

In Costa Rica, for example, the total capital costs including planting, upkeep for 5 years, and necessary tapping and factory processing equipment have been estimated at a total of about $131 a hectare ($53 per acre). A grower, with his family, having 4 hectares of rubber in full production (after the 9th year of age) will be tapping (on the half spiral, alternate daily system) 600 trees a day, which will yield about 16 kilograms (40 pounds) of dry rubber. At a local or export price of as low as U. S. $0.15 per pound, his daily gross earnings would be $6 for about 6 hours of work. This he can count on for at least 250 days a year from his 4 hectares of rubber. His net income would be at least double the prevailing wage rate and, of course, the remainder of his time (beyond the 6 hours) would be available for attention to his subsistence crops and other activities. As a rule, however, no grower will tap his rubber 250 days out of the year because he must devote his full time in rush seasons to planting and harvesting food crops and occasionally to other activities. This entails no harm whatever to his rubbertrees. In fact, resting the trees results in better yields and higher quality rubber. This is one of the great advantages of rubber as a small-farm activity.

Although many hundreds of growers in the various countries have planted small acreages of rubber with material supplied by experiment stations, the proportion of successfully established areas in the cooperating countries varies from total failure to a high percentage of expertly managed and very successful projects. Success depends on proper selection of growers, effectiveness of follow-up inspections, and absence of unusual hazards or circumstances.

Hitherto, it has not been desirable to encourage rapid expansion of planting, because the research program had not developed thoroughly satisfactory material or procedures. The aim has been to go slowly and if possible make a success with the limited number of growers who could be guided adequately. It is believed that once the trees on these places are producing a satisfactory income, other growers will want to plant rubber and that the area planted will gradually increase. This slow development has the advantage of being based on an economic foundation. It has the further advantage of using improved clones and practices as these are discovered. It avoids the losses that have come in some cases from plantings made by a large number of individuals having insufficient knowledge or skill with such a crop.

Promising new districts and localities where no single rubber planting yet exists should be considered along with completion of the "community programs" or patterns already started. Acceleration of planting should be successful if growers are assisted in one of the following ways, in addition to providing a qualified inspector to make monthly or bimonthly visits to instruct and advise them regarding planting, intercropping, pruning, and tapping the trees:

1. Provide trees gratis or for a small sum.

2. Subsidize growers with a stipulated sum from the time the trees are planted until they are 5 years old.

3. Grant loans through local agricultural credit banks or associations in an amount sufficient to carry the expenses. The loan with interest would be amortized gradually after, say, the sixth or seventh year, allowing the fifth year in which to get started with tapping.

4. Encourage growers to meet the expenses of bringing the trees to bearing. Farmers with limited means would necessarily plant a relatively small area and would endeavor to meet cash costs from the sale of intercrops.

In general, it is obvious that for colonization projects the inclusion of rubber will require limited financing by governments under the first three methods. These are now accepted alternatives in most of the countries and require the maintenance of national nurseries to produce and distribute the budded trees of high yielding strains. In nearly all cases these operations, as well as the specialized technical guidance and extension follow-through, are under the control of the cooperative station to which rubber experts of the United States Department of Agriculture are assigned.

The program encourages the setting up of commercial processing plants to convert latex into rubber sheets ready for the market.

Future of Natural Rubber

Before concluding this article, perhaps we should review an important question that is often asked:

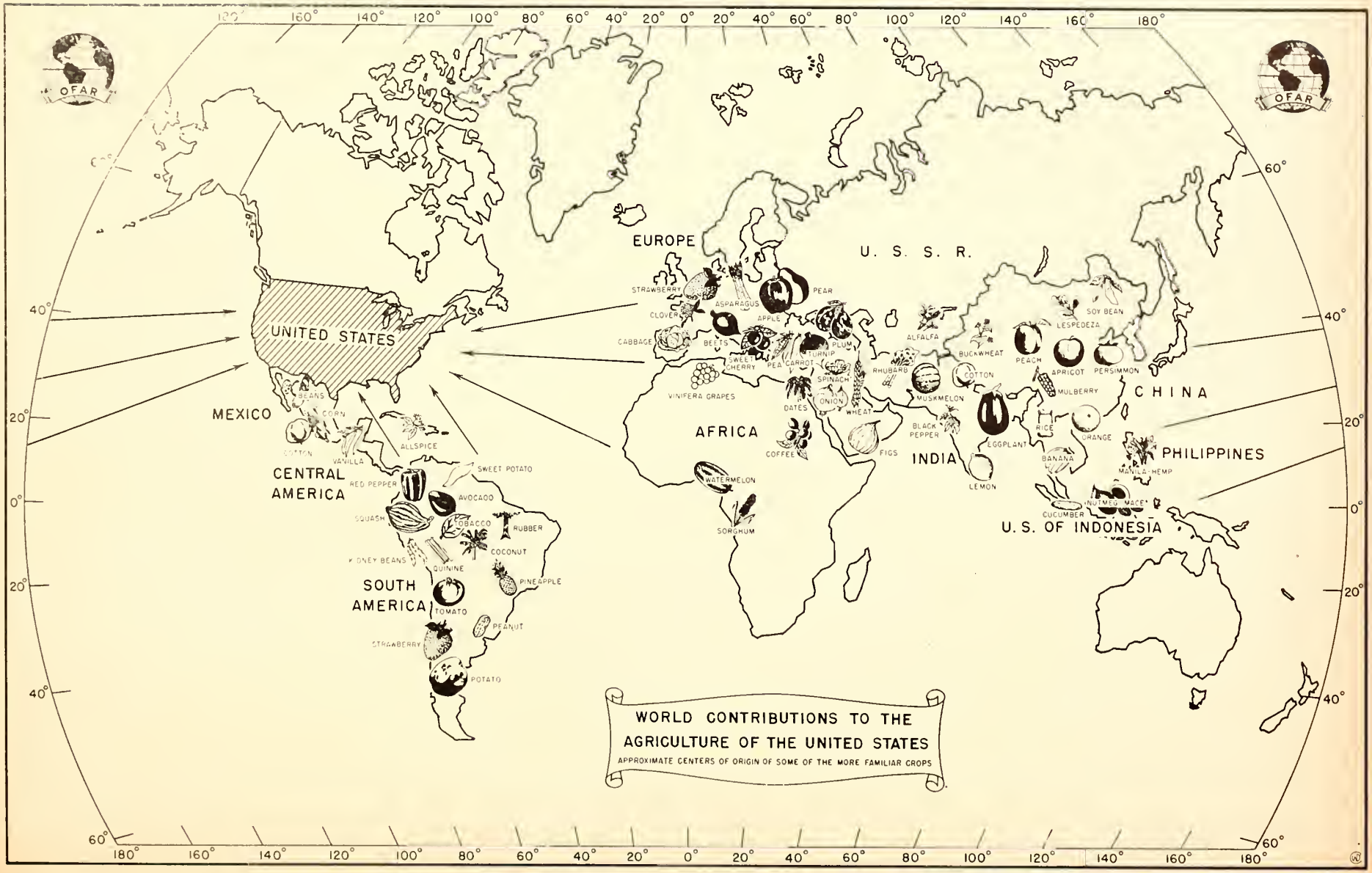
Will not synthetic rubber drive natural rubber out of the market in the near future?

Of course, no one can predict what research may bring forth. It seems fairly certain, however, that there will always be a market for both types provided the price is favorable. In an expanding world economy, especially among the teeming millions of the Far East, the day may not be far off when the present planted areas of hevea rubber may not produce enough to meet the demand.

For any immediate consideration of the question we can only refer to the considered judgment of the foremost authorities in the rubber manufacturing (consuming) industry. This may be summed up by stating that present synthetics cannot entirely replace natural rubber, even in an emergency. About 25 percent of total United States requirements must be natural rubber. In 1948 the United States used nearly 70 percent natural rubber, more than 90 percent of which was imported from the Far East—from areas of recurring economic or political unrest. These factors make stock piling imperative. This is costly and complicated in procurements and stock rotations. Therefore, an appreciable production of natural rubber in the Western Hemisphere will be of strategic importance to the United States.

For Latin America, the problem of synthetic versus natural rubber has other facets. Most countries do not feel that they can invest the necessary millions of dollars in facilities for synthetic production, although domestic requirements are rapidly expanding. They must use scarce foreign exchange to import either synthetic or natural rubber. For example, Brazil manufactured only 236,189 tires in 1940, while in 1948 it produced approximately 1,000,000. Therefore, the policy of the larger countries at least is to produce natural rubber and, if it proves profitable, to expand for export.

The same incentive, but to a lesser extent, prevails among the smaller countries—especially those of Central America—which have only a small internal rubber requirement. For these, the production for export is the prime consideration, but there is as yet uncertainty about competition in the world market, the present threatened overproduction, and the unpredictability of the situation 10 or 20 years from now. Natural rubber production in any part of the world cannot be separated from economics. In this respect, extension work in countries developing hevea rubber solely for the export market should be carefully thought out and executed.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